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THE BRYOLOGIST

A DEPARTMENT OF THE FERN BULLETIN,

DEVOTED TO THE STUDY OF NORTH AMERICAN MOSSES.
ISSUED QUARTERLY.

EDITED BY DR. A. J. GROUT, PLYMOUTH, N. H.

To whom all correspondence regarding the mosses should be addressed.

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THE editor takes pleasure in announcing that the promised illustrated glossary of bryological terms will be begun in the July number of the BRYOLOGIST. Mr. H. N. Dixon and his publisher have very kindly permitted us the use of the drawings in the first five plates of Dixon and Jameson's Handbook of the British Mosses. The editor considers this book to be the best moss manual in the English language, and as it includes a majority of our mosses of Northeastern America it is almost indispensable to the student who wishes to know our mosses well.

PREPARATION OF MOSSES FOR EXAMINATION WITH THE COMPOUND MICROSCOPE.

MOST of us who have studied mosses for some time have come to use by imitation or discovery, some methods of manipulation which may be useful to others. The editor would be glad to have others send notes on this subject in addition to what he presents here.

If the moss be fresh and moist it is all ready for operations. Dried specimens should be softened by boiling. The parts to be studied can be boiled in water on a slide by holding it over a lamp, but it is much better to boil the whole plant. An alcohol lamp and tin cup can be used, or if convenient, boiling water can be poured into a cup and the plant placed in this. This also will serve to drive out the air bubbles that will cling if cold water be used.

One should have the following implements if possible: A pair of fine pointed forceps with comparatively large surface of contact at the points, a pair of small, fine-pointed, sharp scissors, dissecting needles, and a sharp scalpel or razor and a stick of pith.

The leaves should be removed with the forceps by seizing them near their bases and stripping downward; these are then put in a drop of water on a slide and covered with a cover glass; in this drop of water should be placed also a portion of the branch from which the leaves have been stripped. An examination of this last will show whether the bases of the leaves are decurrent or not and will give a profile view of the leaves that will tell whether there are any teeth or papillæ on their backs. With the hair-caps and their allies and some other mosses, a cross-section of the leaves is often necessary to definitely determine the species. This often seems very difficult to a beginner but is really quite simple unless very beautiful sections are desired. The most common method is to split a stick of pith a little distance and insert a bunch of leaves in the cleft, pressing the sides together with the thumb and finger of the left hand. Then cut thin sections of pith and leaves with a very sharp razor or scalpel. The pith should be thoroughly moistened and there should be water on the upper surface of the razor to float away the sections cut. After a number of sections have been made, all the masses of pith and leaf sections should be removed to a drop of water on a slide and the pith and large pieces of leaves should be removed. Pith can be obtained from young elder shoots or the stems of the flowering raspberry, or if nothing better is at hand the pith of a cornstalk can be used. Mrs. Britton thinks that this method is "more bother than it is worth for all simple leaf sections*" but recommends it for other sections. She places a number of the leaves side by side in the same direction so that they may be easily held firm with the thumb nail of the left hand—"begin cutting at the tips of the leaves" (using a razor or sharp knife) "moving the nail from side to side and working downward to the lower half of the leaf." I have often used another method with success. Grasp a bunch of leaves between the thumb and forefinger of the left hand and with the scissors (which must be sharp) cut section after section from the bunch as thin as possible and among the mass of sections will be found some that will show the desired structures. If the leaves are very small a whole stem or branch covered with leaves can be sectioned without first removing the leaves.

* *Observer* for May, 1894.

To study the peristome and annulus, etc.; if the operculum still remains, remove it with forceps or dissecting needle, carefully saving it on the slide; cut the capsule lengthwise with the scissors and spread out each half on the slide, one outside up and the other the inside up; or the capsule can be first split and the pieces of operculum removed afterwards. This prevents any loss of minute parts. If the spores obscure the parts, a minute's boiling over the lamp will scatter them. The walls of the capsule will often curl up so strongly as to make it necessary to split them with the dissecting needles to cause them to lie flat.

WHAT ARE MOSSES?

BY A. J. GROUT AND MARIE L. SANIAL.

THERE are at least three different classes of plants which popularly pass under the name of mosses: true mosses, Hepaticæ or liverworts, and lichens. The lichens are gray, yellow, brown and various other colors and shades, but are seldom of true plant green; then, too, they have no true stem and leaves, but may consist of ascending or even pendant (in the case of tree lichens, "hair moss") stem-like divisions or of a flattened thalloid expansion either membranaceous or coriaceous in structure.

There are two species of lichens to which the name *moss* has been popularly and erroneously applied. The first the hair "moss" (*Usnea*), consists of strong, greenish-gray filaments and resembles a small mane or wig. It clothes the branches of trees and under-shrubs in dark woods and is well known to every hunter of squirrels, from its amazing similarity to the tail of a hiding gray squirrel.

The second is the reindeer "moss" (*Cladonia rangiferina*), the great boon of the Laplander. It simulates a grayish crust-like mass of much-branched, rootless and leafless hollow shrubs in miniature, their height being seldom more than two inches.

The liverworts are more likely to be mistaken for mosses, as they belong to the same branch or subdivision (*Bryophyta*) of the vegetable kingdom, and are very closely related. The foliose hepatics have a stem and leaves, and when sterile some forms may be mistaken for true mosses, even by one who has a considerable knowledge of the plants, especially the alpine *Gymnomitrium*, which has closely appressed but emarginate leaves and julaceous, erect branches.